

## CLAIMS

Having described our invention, we claim:

1. An inductive electrical device for use with multiphase electricity, comprising:
  - a. a first core leg, having a central axis;
  - b. a first pancake coil, wherein said first pancake coil has a height, an inner circumference, and an outer circumference, and wherein the difference between the diameter of said first pancake coil at said outer circumference and the diameter at said inner circumference is substantially greater than said height of said first pancake coil;
  - c. wherein said first pancake coil is placed proximate said first core leg, with said inner circumference being aligned with said central axis of said first core leg;
  - d. a second core leg, having a central axis, wherein said central axis of said second core leg lies parallel to said central axis of said first core leg;
  - e. a second pancake coil, wherein said second pancake coil has a height, an inner circumference, and an outer circumference, and wherein the difference between the diameter of said second pancake coil at said outer circumference and the diameter at said inner circumference is substantially greater than said height of said second pancake coil;
  - f. wherein said second pancake coil is placed proximate said second core leg, with said inner circumference being aligned with said central axis of said second core leg; and
  - g. wherein said second core leg is displaced from said first core leg by a distance which results in a portion of said first pancake coil overlapping a portion of said second pancake coil.

2. A device as recited in claim 1, further comprising:
  - a. a third core leg, having a central axis, wherein said central axis of said third core leg lies parallel to said central axis of said first core leg;
  - b. a third pancake coil, wherein said third pancake coil has a height, an inner circumference, and an outer circumference, and wherein the difference between the diameter of said third pancake coil at said outer circumference and the diameter at said inner circumference is substantially greater than said height of said third pancake coil;
  - c. wherein said third pancake coil is placed proximate said third core leg, with said inner circumference being aligned with said central axis of said third core leg; and
  - d. wherein said third core leg is displaced from said second core leg by a distance which results in a portion of said second pancake coil overlapping a portion of said third pancake coil.
3. A device as recited in claim 1, wherein said first and second pancake coils are made of superconducting materials.
4. A device as recited in claim 3, wherein said superconducting materials are maintained in a superconducting state through the use of a cryostat.
5. A device as recited in claim 2, wherein said first and second pancake coils are made of superconducting materials.

6. A device as recited in claim 5, wherein said superconducting materials are maintained in a superconducting state through the use of a cryostat.